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ABSTRACT

This study examined the concept of quality in child day care and how this can be measured by the Early Childhood Environment Rating Scale (ECERS). Swedish day care centers in three communities were administered a version of the ECERS, which was translated from the original scale to accommodate conceptual differences between Sweden and the United States. Before the ECERS was used, a statistical analysis of the scale showed that some items were highly intercorrelated or had low variability, and these items were combined into one or excluded, thus reducing the 37 original items to 28. Raters demonstrated an average interrater agreement of 83 percent in a study of 40 day care centers in Goteborg, due to the intensive training in how to use the ECERS in a Swedish day care context. Results of using ECERS in the three target communities showed that, compared to other countries, the physical standard of child care in Sweden is high. On the basis of the high cost of child care, the high staff to child ratio, and the high proportions of trained personnel in Swedish day care centers, it is assumed that there also is a high and even quality. By using the ECERS as a measure for pedagogical quality in day care, however, results of studies in the three investigated communities revealed considerable variation in quality. Variation was found in the overall quality between the three communities and within the different aspects of quality in each community. (DR)

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ECERS AS RESEARCH INSTRUMENT

Statistical Analyses

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DEFINING PEDAGOGICAL QUALITY

This presentation is based upon the concept of quality in child day care and how this can be measured by the ECERS.

The concept of quality is problematic, because it can be seen from several different perspectives. Therefore, the answer to what is high or low quality in day care depends on who is answering the question.

Politicians and administrators associate the quality in day care primarily with external structures, that is resources and organizational aspects, such as stuff density, group sizes, low staff turnover and ratios of qualified and unqualified staff (Ds 1988: 1).

According to some researchers quality is a relative concept, which means that it is always associated with a particular situation, a particular epoch and a specific social and cultural context. From such a perspective, the quality of child day care cannot be determined and measured (Moss & Pence, 1994).

In our studies in Sweden, the concept of quality has been defined and measured from a professional and educational perspective.

In our point of view high quality is not only dependent on the presence of economic and material resources in day care. High quality is also dependent on the comptetence and skilfulness of the preschool teachers, a balanced structure and good working conditions.

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The concept of competence has been defined as the preschool teacher´s professional ability to create a good pedagogical environment for each individual child. A good pedagogical environment which is not only secure for the child when the parents are working or studing, but which also provides the child with a richness of experience, and influence the child´s intellectual, emotional, social and cultural development.

In our attempt to find a measure for quality seen from a professional perspective, we elected to use a special scale, the Early Childhood Environment Rating Scale, abbreviated as ECERS.

THE EARLY CHILDHOOD ENVIRONMENT RATING SCALE

The ECERS is developed by Harms and Clifford in 1980. The scale consists of 37 items, each to be rated on a seven point scale.

Our version of the ECERS is a translation from the original scale. Although the attempt has been to follow the original version as closely as possible, some concepts and expressions had to be modified, according to differences in conceptual connotations. Before the ECERS was used in the first research study in Göteborg in 1990, a statistical analysis of the scale showed that some items were highly intercorrelated or had a low variability. These items have, therefore, been combined into one or excluded. As a consequence our version of the ECERS consists of 28 of the original 37 items (Table 1. See also Kärrby & Giota, 1994).

Using the ECERS, the evaluation of the quality is to be made within 37 so called "typical pedagogic situations" in day care, divided into seven different areas, which are:

- the personal care
- the furnishing and display
- the language experience
- the motor activities
- the creative activities
- the social development and
- the adult needs area

Table 1 The Swedish version of the ECERS

Personal Care
1. Greeting/departing
2. Meal
3. Rest

Furnishing & Display
6_7. Furnishing. Learning
8. Furnishing. Relaxation
9. Room Arrangement
10. Child Related Display

Language Experience
11. Understanding Language
12. Using Language
13. Concepts/Reasoning
14. Informal Use of Language

Motor Activities
15_16. Fine Motor
17_20. Gross Motor

Creative Activities
21. Art
22. Music/Movement
23. Blocks
25. Dramatic Play
26. Schedule
27. Guidance

Social Development
28. Space to be alone
29. Free Play
30. Group Time
31. Cultural Awareness
32. Soc.-Emotional Tone
33. Provisions for Exc. Children

Adult Needs
34_36. Adult Pers. Area
35. Professional Growth
37. Provisions for Parents

Every typical situation is to be rated on a seven stage scale. The criteria for the lower points of the scale refer to minimal physical conditions for a child care environment, for example: inadequate resources for learning, inadequate resources for language development, no equipment for gross-motor training or poor access to the same, and a low pedagogic awareness amongst the preschool teachers. The criteria at the upper level of the scale refer to a high level of resourcing, rich and varied material and a high level of professional and pedagogical competence and awareness amongst the preschool teachers. For example, in the free play situation (Table 2) the criteria at the upper level of the scale are fulfilled when, the staff interact with the children, discuss ideas and stimulate their play and activities. This, by acting as an accessible resource for them, and by being aware of the sensitive balance between the child's need for self-discovery and their own opportunities for promoting learning, phantasy and reflection.

Table 2 The free play situation (free choice). Item 29 in the ECERS

Either little opportunity for free play *or* much of day spent in unsupervised free play. Inadequate toys, games and equipment provided for children to use in free play.
Some opportunity for free play, with casual supervision provided as a safety precaution. Free play not seen as an educational opportunity (Ex. teacher misses chance to help child think through solutions to conflicts with others, encourage child to talk about activity, introduce concepts in relation to child´s play).
Ample and varied toys, games, and equipment provided for free play. Adult supervision provided on a regular basis. Free play scheduled several times during the day.
Ample opportunity for supervised free play outdoors *and* indoors with wide range of toys, games, and equipment. Supervision used as an educational interaction. New materials/experiences for free play added periodically.

Pedagogical awareness indicates, in other words, to the theory and experience based competence of the staff at a centre, for forming pedagogic activities which carry maximum posibilities for each individual child to learn, to understand and communicate, feel a sense of community, happiness and creativity.

However, it must be stressed that the ECERS evaluates separate moments within preschool activities, which from developmental perspectives, are intended to promote the learning and all round development of individual children. The scale is not intended to estimate the day care personnel or the children themselves, but the content of the typical situations, and the ways pedagogical activities are carried out to fulfill aims attainment.

USING THE ECERS AS RESEARCH INSTRUMENT

In Swedish research the ECERS has primarily been used in studies investigating the relation between resource efficiency, quality and parental views of quality in day care.

Of the total 200 centers involved in a research project, carried out in 1990 in Göteborg, a stratified sample of 17 centers were chosen, differing in resource efficiency and area of recruitment; half of them from middle class areas and half from areas with low average income. In each of these, one section was rated on quality with the ECERS.

In this study, no clear relations between resource efficiency and quality could be found. That is, resource inefficient centres did not provide better quality care that resource efficient ones. But, this did not apply to centers in socio-economically exposed areas. In these areas high quality demanded a heavy input of resources. These relations were not forthcoming in middle-class areas (see Bjurek et. al., 1994).

The relation between resource efficiency and quality was also investigated in a study carried out in 1993. In this, the quality of 40 day care centers, randomly chosen from the 200 centers included in the original study, has also been related to the parents´ view of quality. This has been measured by a questionnaire, adressed to the parents of the children in each of the 40 day care centers involved in the study (see Kärrby & Giota, 1995).

More recently, the ECERS has been used as self-assessment instrument (see Sheridan, 1995. The Lerum project), and in conjunction with organisational changes (see Däversjö Ogefelt, 1995. The Skövde project), in the community of Lerum and Skövde (Table 3).

Table 3 Number of day care centers in Sweden participated in the evaluation of the pedagogical quality by using the ECERS

Community	Number of day care centers
Göteborg (1990)	17 (stratified sample of the total 200)
Göteborg (1993)	40 (randomly chosen from the 200)
Lerum (1994)	20
Skövde (1995)	44 (randomly chosen of the total 59)
Summary	*121*

WHO CAN USE THE ECERS?

Our answer to the question: "What kind of knowledge must a rater have for being able to evaluate the quality in day care, by using the ECERS?", is:

> *A well developed pedagogical and professional knowledge and/or a deep insight into the day to day activities of child day care centers. In other words, the rater must have knowledge in why the staff do the things they do and what their aims are.*

In our studies, all the raters are preschool teachers with several years of teaching experience. At the time of the studies they attended postgraduate courses in preschool education or worked as reseachers.

Before the final use of the ECERS in each of the 3 communities, mentioned above, the raters were trained together by Gunni Kärrby. Three of them are Sonja Sheridan (the leader of the Lerum project), Anette Däversjö Ogefelt (leader of the Skövde project) and me, the author of this article (Ph. D. cand). We were trained by doing parallell and independent observations in at least 5 day care centers. Each day care center has been observed for approximately eight hours. Under our visit at the day care centers we tried to complement our observations by informal interviews with the staff, the children and in some cases with the parents. After or during the visit each of us independently completed the ECERS. Then, we discussed our ratings in pairs and in group. The ratings were discussed in group and with the tutor Gunni Kärrby in at least five 2-hours sessions.

However, over and above a professional and pedagogic competence the rater must also know how to use the ECERS "mechanically", that is to discriminate between the quality criteria the instrument is developed upon. In our studies this competens has been tested through assessments of interrater reliability (Table 4).

As can be seen in Table 4, in the study of the 40 day care centers in Göteborg the average interrater agreement is of 83%. It can be mentioned that 30 of the 40 centers in this study have been rated by rater number 2 and me, the author of this article. The agreement between us was of 91%.

In the community of Lerum the interrater agreement is of 99% and in Skövde of 95%.

These ratings have, in other words, a great reliability. This, must be stressed, is the result from very intensively training in the how to use the ECERS in a Swedish day care context.

Table 4 Interrater agreement analysis of the ECERS

Day Care Centers	Percent of total Agreement (1)	Percent of Disagreement in order of only one rating point (2)	Cumulative Percent (1 + 2)
Göteborg (5 day care centers)			
Day care center A (5 raters)			
- Gunni and rater 2	22.2	51.9	74.1
- Gunni and Joanna	22.2	33.3	55.6
- Joanna and rater 2	53.6	39.3	92.9
- raters 2 and 4	22.2	51.9	74.1
- Sonja and rater 2	29.6	48.1	77.8
- Sonja and rater 4	78.6	21.4	100.0
- Joanna and rater 4	29.6	37.0	66.7
- Joanna and Sonja	29.6	44.4	74.1
- Gunni and Sonja	34.6	30.8	65.4
- Gunni and rater 4	26.9	42.3	69.2
Day care center B (3 raters)			
- Gunni and rater 2	18.5	63.0	81.5
- Gunni and Joanna	44.4	55.6	100.0
- Joanna and rater 2	37.0	48.1	96.3
Day care center C (3 raters)			
- Gunni and rater 2	35.7	57.1	92.9
- Gunni and Joanna	50.0	46.4	96.4
- Joanna and rater 2	53.6	35.7	89.3
18 Combinations for 5 Raters:	**M = 39.4**	**M = 43.4**	**M = 82.9**
Lerum (3 day care centers)			
3 Combinations for 2 Raters (Sonja and rater 2)	**M = 66.6**	**M = 32.1**	**M = 98.7**
Skövde (9 day care centers)			
28 Combinations for 5 Raters (Gunni, Joanna, Anette and rater 4 and 5)	**M = 60.4**	**M = 34.9**	**M = 95.3**

RESULTS

Mean Scores

Compared to other countries, the physical standard of child care in Sweden is high. Moreover, on the basis of the high cost of child care, the high staff/child ratio and the high proportions of trained personnel in Swedish day care centers, it is assumed that there also is a high and even quality.

By using the ECERS, as a measure for the pedagogical quality in child care, the results of our studies in three different communities, show us a considerable variation in quality (Table 5). The variation is to be found in the overall quality and the different aspects of quality, as measured by the ECERS subscales, between the three investigated communities, and within the different aspects of quality in each community. These conclusions are based on statistical analyses of variance, which are not presented in this article.

Table 5 Mean Scores on the ECERS Items and subscales in three communities (n = day care centers)

Items in each subscale	Göteborg n = 40	Lerum n = 20	Skövde n = 44
		Item Means	
Personal Care			
1. Greeting/departing	4.12	4.55	4.27
2. Meal	4.32	4.80	4.57
3. Rest	4.52	4.55	4.23
Subscale item mean	**4.32**	**4.63**	**4.36**
Furnishing & Display			
6-7. Furnishing. Learning	4.42	4.75	3.84
8. Furnishing. Relaxation	4.12	4.45	3.75
9. Room Arrangement	4.70	4.80	4.32
10. Child Related Display	4.55	4.50	3.95
Subscale item mean	**4.45**	**4.62**	**3.96**
Language Experience			
11. Understanding Language	4.32	4.85	3.89
12. Using Language	4.40	4.50	3.90
13. Concepts/Reasoning	3.95	4.30	3.70
14. Informal Use of Language	4.52	4.25	4.11
Subscale item mean	**4.30**	**4.48**	**3.90**
Motor Activities			
15-16. Fine Motor	4.72	4.70	4.10
17-20. Gross Motor	4.57	5.00	4.77
Subscale item mean	**4.65**	**4.85**	**4.43**
Creative Activities			
21. Art	4.70	4.85	4.23
22. Music/Movement	4.62	5.10	4.25
23. Blocks	4.17	4.85	4.15
25. Dramatic Play	4.10	4.25	3.70
26. Schedule	4.65	4.60	4.14
27. Guidance	4.57	4.30	4.23
Subscale item mean	**4.47**	**4.66**	**4.12**
Social Development			
28. Space to be alone	4.70	4.60	4.32
29.Free Play	4.38	4.30	4.14
30. Group Time	4.40	4.20	4.36
31. Cultural Awareness	2.52	1.80	1.61
32. Soc.-Emotional Tone	4.90	4.65	4.81
33. Provisions for Exc. Children	4.52	4.65	3.95
Subscale item mean	**4.24**	**4.03**	**3.87**
Adult Needs			
34-36. Adult Pers. Area	4.18	4.95	4.80
35. Professional Growth	3.98	4.85	3.98
37. Provisions for Parents	4.48	4.60	4.68
Subscale item mean	**4.21**	**4.80**	**4.48**
Summary Statistics for 28 items	**4.36**	**4.52**	**4.10**
The total reliability of the ECERS **(Cronbachs´s alpha)**	**0.92**	**0.86**	**0.94**

Reliability

For answering the question: "How reliable is the ECERS as research instrument?", and thus, the obtained results, Cronbach´s alpha has been used for assessing the reliability of the ECERS subscales separately and the reliability of the ECERS as a whole (see also Kärrby & Giota, 1994). On the basis of the statistical analyses of the ECERS as a whole, it has been concluded that our Swedish version of the ECERS, has a sufficiently high degree of reliability. The obtained alpha values range from 0.86 to 0.94 (Table 5). These values are to be compared with 0.70, the value accepted as providing an instrument, which gives reliable non-random measures (Polit & Hungler, 1983).

Factor analysis

What did we measure in our studies?

For answering this question a range of factor analyses have been performed on the three different samples in our studies. The items in the original ECERS are divided in seven subscales, expected to measure 7 different aspects of pedagogic quality.

In our factor analysis, in the study of the 40 daycare centers in Göteborg seven factors were identified. These factors, interpreted as separate dimensions of pedagogic quality have not the same content as the seven quality aspects in the original scale (Table 6). The three first factors explaining together 58 percent of the variance in the factor model, have been interpreted as the:

- Quality of socialisation and communicative environment (Factor 1)
- Quality of use of space and material for learning experience (Factor 2)
- Quality of creative experiences (Factor 3)

The first factor, including 8 items, is the most homogenous factor of all the factors. It explains 40 percent of the variance and can be interpreted as the quality of the overall socialization and communicative environment.

The second factor, explaining about 11% of the variance in the model, includes variables related to the availability and use of space and material resourses. This is to be interpreted as the quality of the use of material to enhance the learning and development of each child (see also Kärrby & Giota, 1994).

Table 6 Loadings of the ECERS items on the seven quality factors in the community of Göteborg. (n = 40 day care centers)

Variables	Abbreviated title of factors						
	1	2	3	4	5	6	7
27. Guidance	.96						
32. Social Emotional Tone	.77						
14. Informal Use of Language	.76						
26. Schedule (Planning/Flexibility)	.76						
29. Free Play (Children´s Initiative)	.75						
2. Meal	.72						
12. Using Language	.68						
11. Understanding of Language	.56						
23. Block Play		.89					
9. Room Arrangement		.76					
13. Concepts/Reasoning		.71					
15-16. Fine Motor Activities		.65					
10. Child Related Display		.59					
6-7. Furnishing. Learning		.59					
8. Furnishing. Relaxation		.57					
11. Understanding of Language		.55					
35. Professional Growth			.79				
30. Group Time & Organization			.69				
10. Child Related Display			.61				
21. Art			.55				
22. Music/Movement			.55				
37. Provisions for Parents				.78			
3. Rest				.77			
33. Provisions for Exc. Children				.65			
34-36. Adult Personal Area					.70		
8. Furnishing. Relaxation					.65		
28. Space to be Alone					.55		
17-20. Gross Motor Development						.83	
31. Cultural Values							.73
1. Greeting/Departure							.60
Eigenvalue	11.01	3.01	2.18	1.85	1.44	1.33	1.10
Percent of Variance	39.3	10.7	7.8	6.6	5.1	4.8	3.8

Factor 1: "Quality of socialisation and communicative environment", collectes the typical pedagogic situations, which comprise the most fundamental determinants of child development in early childhood education settings (Table 7).

As we interprete these items, they also reflect the general pedagogical aims of child day care in Sweden. These aims were emphasized in national policy as early as 1972, in the then Commision of Enquiry inot the Child Day-Care Provision. In 1987 they were expressed in the National Bord of Health and Social Welfare as general guidelines and recommendations for pre-schooling, in the National Preschool Education Program (NPP, 1987:3, 1995:2).

Table 7 ECERS items in Factor 1: Quality of socialisation and communicative environment

ECERS items	*Factor loadings*
V26. Guidance	.96
V31. Social Emotional Tone	.77
V14. Informal Use of Language	.76
V25. Schedule (Planning/Flexibility)	.76
V28. Free Play (Children´s Initiative)	.75
V2. Meal	.72
V12. Using Language	.68
V11. Understanding of Language	.56

The item with the highest loading, Guidance, is a rating of the quality of interaction between the children and the preschool teachers. It measures the degree of the preschool teacher´s awareness of and attention to every child's individual needs, such as the need for independence, emotional security, of taking initiative, and developing through its own activities and interests.

The item social-emotional tone is a measure of the warmth of the social interaction generally, but also the ability of the teachers to create an environment that minimizes conflicts by observation and planning of activities.

The item with the third highest loading, informal use of language, is a measure of the informal communication between the teachers and the child. The criteria for the lower points describe a practice characterized by a directive question-and-answer type of communication. The criteria for the highest points are expressed as dialogue type communication, exchange of ideas and challenging questions that captures the child´s experiences, interests and own ideas.

The item schedule measures the effort of the teachers to plan routines and educational activites during the day, in such a way that a balance between structure and flexibility is obtained in the daily schedule.

The item free play, which in the Swedish version is labelled "childs own initiative", include the rating of opportunities for children to take initiatives in all activities.

Factor 1 includes also the Meal item. In Swedish day care centers the meal situations are by tradition often used as opportunities for conversation and have thus a clear social-educational dimension.

The other two language items, Using language and Understanding of language, measure the planned training of language skills. These two items confirm also the interpretation of the first factor as an educational dimension.

Summarizing, the first factor reflects the general philosophy of Swedish day care centers, characterized as an informal child oriented setting with emphasis on social-emotional development and non-direct teaching of communicative skills.

In the study of the 40 day care centers in Göteborg, all the items in factor 1 are rated above average.

Finally, it can be mentioned that the factor analyses in the study of the 44 day care centers in the community of Skövde showed 3 other dimensions of quality in day care than the dimensions presented above. These dimensions are to be presented in an another article.

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